Project Dissertation Report on

STUDY OF DIGITAL PAYMENTS IN INDIA

Submitted By:

Kushagra Bhardwaj

2K20/EMBA/22

Under the Guidance:

Mr. Chandan Sharma

Assistant Professor

DELHI SCHOOL OF MANAGEMENT

Delhi Technological University

Bawana Road Delhi 110042

CERTIFICATE

This is to certify that this project report titled **"Study of Digital Payments in India"** is a bona fide work carried out by **Mr. Kushagra Bhardwaj** of **EMBA 2020-22** and submitted to Delhi School of Management, Delhi Technological University, Bawana Road, Delhi-42 in partial fulfilment of the requirement for the award of the Degree of Masters of Business Administration.

Signature of Guide **Signature of Head (DSM)**

Seal of Head

Place:

Date:

DECLARATION

I, **Kushagra Bhardwaj**, student of **EMBA 2020-22** of Delhi School of Management, Delhi Technological University, Bawana Road, Delhi – 42, hereby declare that the project report **"Study of Digital Payments in India"** submitted in partial fulfilment of Degree of Masters of Business Administration is the original work conducted by me.

The information and data given in the report is authentic to the best of my knowledge.

This report is not being submitted to any other University, for award of any other Degree, Diploma or Fellowship.

Place: **Kushagra Bhardwaj**

Date:

ACKNOWLEDGEMENT

I would like to express my sincere gratitude towards my Guide, Mr. Chandan Sharma (Assistant Professor, Delhi School of Management, DTU) for his support and valuable guidance throughout the duration of the project. I thank him for the constant encouragement and support at every stage.

My sincere gratitude goes out to my colleagues whose participation in the project gave many valuable inputs for its completion.

Kushagra Bhardwaj
(2K20/EMBA/22)

ABSTRACT

The evolution of Information Technology has revolutionized the various aspects of our day to day life. One such aspect came in the form of Digital Payments with the increasing demand of smart phone and ease of internet availability. With the government programmes like Digital India to promote digital payments and transaction and initiatives like demonetisation which paved the way for digital payments across the country. The percentage of digital payment across the modes is increasing with a significant speed. As the reach of internet expands to Tier 4, 5 cities, small towns and villages, this cashless transaction is certainly going to cross new heights.

Here, we will study about Digital Payments and government of India initiative for Digital Payments. The report will cover the different digital payment modes, the growth and increasing trends of digital payment with the help of Secondary study. This report also covers the Primary study to showcase the adoption of digital payments over cash payments during Covid-19 Pandemic.

Contents Table

1.0 Introduction **1**

1.1 Background 2

1.2 Digital India Programme and Demonetization 2

1.3 Key Factors under digital payments 4

1.4 Objectives of the Study 4

2.0 Literature Review **5**

3.0 Digital Payment Modes **7**

3.1 Banking Cards 7

3.2 USSD 9

3.3 UPI 11

3.4 Mobile Wallet 13

3.5 Internet Banking 15

3.6 IMPS 15

4.0 Research Design & Methodology **16**

5.0 Digital Payment Players **17**

6.0 Fraud- A Bane for Digital Payments **19**

7.0 Data Analysis **20**

7.1 Growing RUPAY 20

7.2 Sky Rocketing UPI 21

7.3 Forecasting Using Time Series Technique 23

7.4 Primary study 30

8.0 Suggestions **34**

9.0 Limitations of the study **35**

10.0 Conclusion **36**

References **37**

Annexure 1 ..... **38**

Annexure 2 ..... **41**

1. INTRODUCTION

Digital payment is a way of payment which is made via digital modes. In digital payments, payer and payee both can use digital modes to send and receive money. It is also called electronic payment. No hard cash (currency notes) is required in the digital payments. All the transactions in digital payments are completed through internet. It is an instant and convenient way to make payments.

With the advancements in technology sector in the last decade, several interesting and pretty useful services have been seen in the digital payments to put a positive impact on our daily life. Digital Payment system (methods or modes) which are currently available include Banking cards, USSD(Unstructured Supplementary Service Data), AEPS (Aadhaar Enabled Payment System), UPI (Unified Payment System), Mobile Wallets, Bank Prepaid cards, POS (Point of Sale), Internet Banking, Mobile Banking, Micro ATMs.

According to the data numbers released by NPCI (National Payments Corporation of India) for November 2020, UPI transaction count reached to 2.21 billion, IMPS transaction count reached to 339.11 million and NETC (National Electronic Toll Collection) –Fastag reaches to 124.88 million transactions.(Panda, 2020)

Source: NPCI

1.1 Background

Going back to a decade or so, Indian people were hesitant to include online payment or transaction in their lives as physical (cash) transaction was the only trusted, safe and secure way. However, online/net banking was present in the Indian payment eco-system since initial 2000s but it was only confined to large business transactions. In the same way, the use of Card system (Debit or Credit) was only restricted to Metro cities.
In 2016, POS (Point of Sale) terminals came into effect full-fledged way in Indian financial system. This paved way to rise in card transactions in more and more cities and not just in metro cities, people started normalising card payment and transactions while shopping in Malls, Retail stores, etc.

1.2 Digital India Programme and Demonetization

The Digital India programme is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy (www.digitalindia.gov.in). Cashless, Faceless, Paperless were the 3 terms coined for the responsibility of Digital India. Government of India promoted digital payment so very much in every sector of the country to give push to its Digital India Initiative.

The aim was to give convenient, easy, affordable, quick and secured way of payments to the citizens of India seamlessly.
Another initiative or policy taken by Government of India to curb down black money was Demonetization on 8th Nov-2016 which acted as a catalyst to promote and accept Digital Payments (ET Online, 2019). Also, the government's initiative to compel Indian telecom companies (operators) to slash the service cost in order to dig deeper penetrations internet availability and accessibility among the consumers especially rural customers, it could be made feasible due to technological and infrastructural advancements. Within that night of demonetization declaration people learned and adapted digital ways of payments and making transaction. After demonetization happened, government also landed ways in front of the citizen by providing concessions, incentives, or benefits in order to attract the customer.It paved customers a reason for coming onto digital platforms and normalizing it.

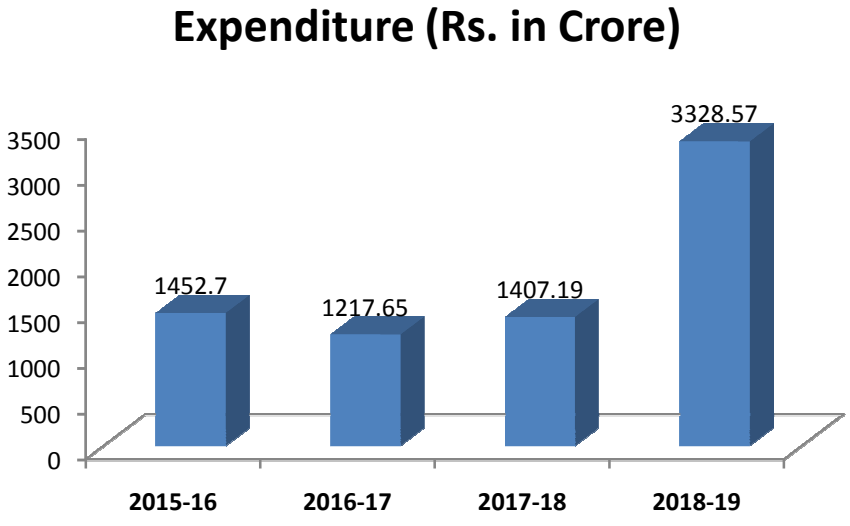
Application program interface (API), payment applications, platforms, payment gateways started to roll-in and started to boost Indian economy in digital space.

With the sudden inception of payment platforms and applications, several businesses along with lending businesses got a very good rise in the sectors like cab services, food delivery services, online market places, grocery shopping, etc. All these new age businesses boats have sailed due to digital transactions and their revenues and ROIs (return on investment) have touched the skies with the boom of electronic payments.

In addition to this, Govt of India started "Jan DhanYojna" wherein people's bank accounts were created. RBI and Indian Banks Association also launched NPCI which in turn launched RUPAY and BHIM (UPI based payment application) which was made accessible to the country.In digital India policy framework, linking Aadhaar with user accounts was a big change.

There were 30 banks that had shared action plan for promotion of Digital Payments. The expenditure allocated to Ministry of Electronics and Information technology under Digital India programme rose to around 130% from 2015-16 to 2018-19.

Below is the chart showing YoY expenditure data.



Data Source: data.gov.in

1.3 Key Factors under Digital Payments

There are number of variables which influenced this swift development of online payment industry,

- Ease of making transaction,
- Sky rocket mobile & internet usage,
- Rising non-bankingfirms & entities,
- Flexible legislative(government) rules and practices,
- Emerging End user'sinterest for E-payment.

India is at 5th place having online base of customers with around 300 million in numbers. About 50% of this customer base is mobile internet users which definitely embarks a success tale of India's digital payments.

1.4 Objectives of the Study

The basic objective of this report is to know about.

i) What is a Digital Payment and Government of India initiative in promoting Digital Payments

ii) Study various modes of digital payments

iii) Digital Payment adaption in Covid-19 pandemic

iv) Skyrocketing UPI transactions and predict UPI transactional data using Regression Technique

v) Limitations, Suggestions and recommendations in handing digital payments as easy and convenient one.

2. LITERATURE REVIEW

Literature Study

I. Dr. Indrajit Sinha, Sanghita Roy (2014), According to the report, India's e-payment system has grown rapidly, but there is still much work to be done to enhance its use. Despite this, cash is still used in 90% of transactions. The study's methodology was the Technology Acceptance Model. They discovered that four variables contribute to the strength of the E-payment system: innovation, incentives, customer convenience, and regulatory framework.

II. Rakesh H M and Ramya T J (2014) attempted to explore the elements that drive internet banking adoption in their research paper "A Study on Factors Influencing Consumer Adoption of Internet Banking in India. The perceived dependability, perceived ease of use and perceived usefulness are all factors that influence internet banking. Experts can emphasise the benefits of internet banking services adoption, and consumer awareness may be improved to draw attention to internet banking services.

III. Suma K,. and Hema Divya K.(2018) According to a study on digital payments in India with a focus on consumer adoption, the deployment of technology for digital payments has enhanced the banking sector's performance and enabled the country to realise its goal of being a cashless society. Only 1 city sample was taken, correlation can vary.

IV. Kumar, V., Dalal, S., Mani, M., & Jambheshwar, G., Jitendra Singh, Mahesh Kumar Chaubey (2019)-Business Management and Social Innovation Predicting Digital Payment: An Indian Perspective - They concluded that Unprecedented growth trend was witnessed in the month of May and June in the year 2017 and 2018 and heading towards seasonal growth. They took only secondary data to make their prediction.

V. Another report from one of the Universities of India was read. The report talks about the online payment system in Indian context.

These are some of the objectives of the report:

- ✓ It had a basic objective of knowing the most popular digital payment ways in India.
- ✓ Its specific objectives were to explore diverse/various modesof online/digital payment provisioned by various financial institutions in India.
- ✓ To measure the extent of digital payments operations during online transactions.
- ✓ Offering relevant suggestions to handle digital payments in a simple and convenient way.

Report Conclusion

Digital Payments are going to be must in the future and the change in habits of accepting digital payments should also change with the time. It says cash free transactions are not only safe but it takes a less time. Also, all the transaction either small or big can be recorded. Report mentions there are more than 100 crore mobile (active) connections in India which comprises of 22 crore smart phone users till Mar'16. The number is definitely going to increase with faster internet speed (4G) and the reach of internet and electricity is also increasing in remote areas which will indirectly increase the digital payments penetration.

3. DIGITAL PAYMENT MODES

As part of promoting cashless transactions and converting India into less-cash society, various modes of digital payments are available.

3.1 Banking Cards

It is the mode of payment which provides more security, convenience and control over the transaction than any other payment method.There are 3 types of cards available viz. Credit, Debit and Pre-paid.All these cards have 2 FA process (two factor authentication)ex.PIN, OTP. MasterCard,RuPay and Visa, are 3 payment systems or networks available. These payment cards have few advantages:

- Gives purchasing power to customer
- Customer don't require smart phone or internet availability
- Saves customer's and merchant's money and time plus it provides ease

3.1.1 Process of Sign-up:

- KYC (Know Your Customer) document required for opening account
- Option of applying Debit or Credit Card
- Get PIN

3.1.2 How to activate Service:

- To activate PIN, one needs to visit ATM
- Could take around 3-7 days

3.1.3 Transaction Requirement:

- Payment Gateway (online) orPOS machine
- Provide card for transaction
- Enter PIN
- One Time Password, i.e., OTP that needs to be sharedreceived on an individual's registered mob.number to complete the transaction.

3.1.4 Cost Associated with Transaction:

- No cost to consumer for merchant related transactions.
- Banks decide ATM transaction fee.
- 0.50% to 2.25% as MDR (Merchant discount rate).

Disclaimer: The transaction costs may vary from bank to bank.

3.1.5 List of Service Offerings:

Cards can be used at,

- PoS (Point of Sale) machines,
- ATM,
- Shops,
- wallets,
- online transactions,

International cards (debit/credit) can be used for multiple currencies around the globe.

3.1.6 Limit of Fund Transfer:

- Transaction limit can be set by user.
- Credit Ratings also decides limit.

Disclaimer: The fund transfer limit may vary from bank to bank.

3.1.7 Number of banks (operators) provide this service:

- 751 banks (Source: NPCI)
- Interoperability is allowed

3.2 USSD (Unstructured Supplementary Service Data)

This payment service *99# operates on the Unstructured Supplementary Service Data (USSD) channel by telecom. It allows mobile banking transactionvia feature phone.

*99# service is offered by 51 banks and all GSM telecom service providers and works in 12 different languages comprising Hindi, English.

3.2.1 Process of Sign-up:

- Provide KYC (Know Your Customer) information to open a new account
- Mobile no. should be linked with bank a/c
- Register for USSD/Mobile Banking
- Get MMID (Mobile Money Identifier)
- Get MPIN (Mobile PIN)

3.2.2 How to activate service:

- None
- 1-2 minutes

3.2.3 Transaction Requirement:

- One needs to remember MMID
- One needs toremember PIN
- One needs to enter *99# in the phone and dial the string
- Registered mob. No, with any type ofmobile phone
- Self assisted

3.2.4 Cost associated with Transaction:

- Zero
- Rs. 0.50 is a cost to consumer

Disclaimer: The Cost associated with Transactions varies bank to bank.

3.2.5 List of Service Offering:

- Balance enquiry
- MMID
- Mini Statement
- Change M-PIN
- Funds transfer
- Aadhaar

- Generate OTP

3.2.6 Limit of Fund Transfer:

- Rs 5,000 per day
- Rs 50,000 per annum

Disclaimer: The Limit of Fund Transfers varies from bank to bank.

3.2.7 Number of banks (operators) provide this service:

- 51 banks
- Interoperable

Disclaimer: Count of bank can vary in the current situation.

3.3 UPI (Unified Payment System)

Unified Payments Interface is a system which supervises multiple bank accounts into one mobile based application, and merging several banking services & features, seam-less fund dispensing& merchant payments into single umbrella. It caters **Peer to Peer** requests thatcan be scheduled and paid according to requirement & convenience. Banks provide their own UPI App for Android and iOS mobile platforms.

3.3.1 Process of Sign-up:

- Bank account
- Customer's mobile no. must be tied up with bank account
- Smartphone having internet
- Debit Card for setting UPI PIN.

3.3.2 How to activate service:

- Download the UPI App
- Complete registration on the mobile UPI App with acc. detail
- Form a UPI ID
- Set UPI PIN

3.3.3 Transaction Requirement:

- Smartphone having internet
- Registered mobile only
- Use registered UPI PIN

3.3.4 Cost associated with Transaction:

- Zero to customer
- Only data charges apply

Disclaimer: The Cost associated with Transactions varies from bank to bank

3.3.5 List of Service Offering:

- Check account balance
- Payment/Transaction History
- Pay/Send Money
- Aadhaar
- Receive Money
- Add bank account(s)
- Change / Set UPI PIN

- Get Notifications
- Account Management

3.3.6 Limit of Fund Transfer:

- 1 lakh / transaction

Disclaimer: The Limit of Fund Transfers varies from bank to bank

3.3.7 Service Availability by number of operators:

- 30 banks
- Interoperability is present

Disclaimer: List of the banks may vary in current situation.

3.4 Mobile Wallet

Mobile wallet is a mechanism to keep money in digital way just bylinking CC or DC info.In the mobile phone to mobile application having wallet availability or you can use website to send money online to any mobile wallet application.

Many banks already have their wallet applications.

ex. **Paytm, PhonePe, Freecharge, Oxigen, Mobikwik, Jio Money, AirtelMoney, SBIBuddy,CitrusPay,Axis Bank Lime,VodafoneM-Pesa,** etc.

3.4.1 Process of Sign-up:

- Option for opening Zero or Full(complete) KYC wallet
- Choice for opening Customers OR Merchants wallet
- Registered Mob. No.
- Mobile wallet application

3.4.2 How to activate service:

- Add money (only allowed limits)
- Bank Account
- All types of cards(credit/debit)

3.4.3 Transaction Requirement:

- Smartphone having internet or website
- App PIN
- Works in both ways self or assisted

3.4.4 Cost associated with Transaction:

- Customers pay for remittances to bank account @ 0.5%- 2.5%of fix fees.

Disclaimer: The Cost associated with Transactions varies from bank to bank

3.4.5 List of Service Offering:

- Check Balance
- Passbook orprevious Transactions
- Add /Pay/Accept Money
- Cash-In
- QR Code reader
- Manage Profile

3.4.6 Limit of Fund Transfer:

- For Users,No KYC–Rs. 20,000 /month,Full KYC–Rs 1,00,000/- per month
- For Merchants,Self-Declared-Rs 50,000 per month
- With KYC – Rs 1,00,000 per month

Disclaimer: The Limit of Fund Transfers varies from bank to bank

3.4.7 Service Available from no. of operators:

- 40
- Cash-With drawl (Out) not available
- No-interoperability

3.5 INTERNET-BANKING

Internet-Banking is known as e / virtual/ online banking, that's an electronic payment mode which enables customer to complete financial transactions via financial institution's/bank's website.

Various types of online transactions are:

3.5.1 NEFT (National Electronic Fund Transfer)

- NEFT is an Indian payment system covering 1-2-1 fund transfers.
- Firms, Individuals, companies can transfer funds electronically from a bank to a person, firm or company who has an acc. with other branch of bank.
- Customers who do not have bank account have a limit of Rs. 50,000 per transaction.

3.5.2 RTGS (Real Time Gross Settlement)

- RTGS is a continuous and real-time settlement of transfer of funds.
- 'Real Time' defines as the processing of instructions at the same when it is received not at later time.
- Gross Settlement is the funds transfer settlement instructions that occur on an instruction by instruction basis.
- RTGS is used for large amount of transactions. The minimum amount through RTGS is 2 lakh. No upper limit is present.
- Earlier there was timing restriction for RTGS transaction but currently it is opened 24*7.

3.6 IMPS (Immediate Payment Service)

It is a24*7 service, bank to bank (interoperable)electronic/onlinemoney/fund transfer service via mobile devices.

It is an important tool for transferring money in an instant way within Indian banks through handheld devices, mobile phones, internet and ATM. It is one of the safest and economical modes of payment in financial and non-financial point of views.

4. RESEARCH DESIGN AND METHODOLOGY

Research design is the base on which any researcher proceeds toward the study of the problem once the hypothesis has been established. It is the blueprint of the detailed procedure of testing the hypotheses and analysis of the obtained data.

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research with a purpose of economy in procedure. The collection of essential information to prove their hypotheses is a significant and distinctive stage of research in any science. The purpose of preparing research design could be either to test the hypotheses or to give a cause effect relationship to the given situation. The sources of information are generally classified as primary data and secondary data.

4.1 PrimaryData

Primary data is the data collected or generated by the researcher/person himself for the purpose of the project immediately at hand. When the data is collected for the first time, the responsibility for the processing of data also lies with the original researcher. This type of data is also called basic or original data. In other words, the primary data refer to observations, measurements, answers, information which the researcher collect for the purpose of research.

Different types of Primary Data are:

Questionnaire

A questionnaire is a very popular method of data collection. It is being adopted by private individual, research workers, private and public organizations and even by governments. In this method a questionnaire is sent to the person concerned with a request to answer the questions and return the questionnaire. A questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms. The respondent has to answer the questions on their own.

Interview

In every field of research, the interview method of research is used very extensively. Only

through interview, varied types of data can be gathered intensively and extensively. Besides, interview is a meant for assessing the personality of the respondent. All types of people whether educated or uneducated can be covered by this method. It is generally, interaction assumed that the personal interview helps to obtain the most accurate information.

4.2 Secondary Data

Here the analysis relies on already existing data that may be either published or unpublished. This source of data is updated source of information. Researcher has to collect the data from books in university and libraries, Internet websites and published journals.

5. DIGITAL PAYMENT PLAYERS

There were many players who came into picture when the Govt. of India launched digital India programme in 2015 and at the time of demonetisation to take the advantage in the market.

As part of promoting cashless transactions and converting India into less-cash society, there has been a cut throat competition in the market players especially when we talk about UPI payments are Google Pay, PhonePe, Paytm Payments Bank, Amazon Pay, BHIM, Yes Bank Apps, ICICI Bank Apps, Axis Bank Apps, State Bank of India Apps, Airtel Payments Bank Apps and the newest entry is Whatsapp Pay.

Based on the app wise data released by NPCI, top three players which has over 94% market share in UPI payments are Google Pay, PhonePe and Paytm.

- **Google Pay**dominated the market recording 960 mln. transactions in November 2020 on its app and the market share is noticed to 43.4% of UPI.
  It added to about 100 million transactions as 857.8 million were recorded in October 2020.
- **PhonePe**calculated close to 868.40 mln.transactions in November, which is almost 39% of the market share.
- **Paytm** closes about 260 million transactions which count to 11.7% market share.

Peer-to-peer (P2P) payments were coming out to be 60% of the all in all payments at UPI in November; however peer 2 merchant transactions evaluated to 40% of the overall transactions.

6. FRAUDS-A Bane for Digital Payments

It is rightly said that excess of anything leads to destruction or technology proves to be bane if not used wisely.

6.1 Types of Frauds

The online transaction process comprised of multiples entities at different stages like online marketplace, shop merchants, PGs, banking/financial institute, excluding the consumers, each entity can work as a threat or bring in vulnerability. Electronic/Online Commerce frauds can be categorised into following:

- **Frauds @ Buyer Side:** Fraud claims, chargebacks, proxy/duplicate/fake buyer account,promotion/coupon code, etc.
- **Frauds @ Merchant Side:** Account takeover, identity theft, card detailtheft, triangulation fraud, etc.
- **Frauds @ Cyber Security:** Selling counterfeit, non-fulfilment, etc.

6.2 Certain Challenges:

- Multilevel awareness is lacking
- Fraud detect, enforcement, investigating and legislative challenges
- Emerging expertise and collaboration with different industries
- Not enough investments on security
- Laws of Privacy

6.3 Fraud Prevention Measures & Upcoming Technologies:

- IP Geo-location to verify consumer's know how to locate timestamp of purchase.
- Rules Engines that will initiate merchants to generate rules on order management.
- Proxy Internet Protocol addresses detection for immediate detection of unknown Internet Protocol addresses.
- ML (Machine leaning) to know actual insights to predict & detect the frauds.
- Automated Workflow to speed up payment fraud checks, blocking suspicious devices, fulfilment and cancellation of fraudulent orders, etc.
- To stop frauds at its root, use of device fingerprinting, from web browser and OS based on language and location.

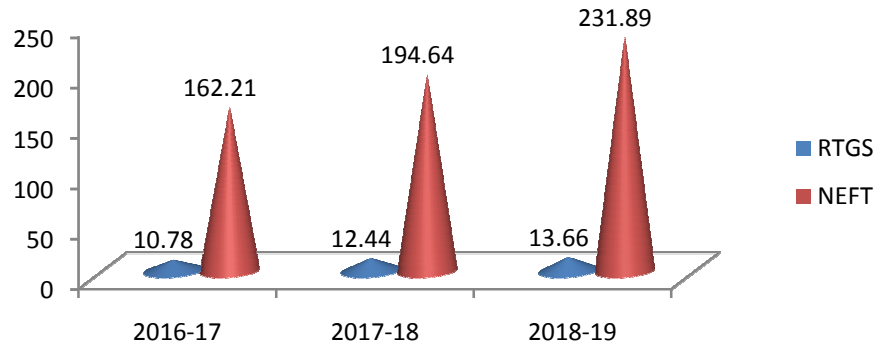
7. DATA ANALYSIS

Based on the data available on government websites, NPCI, financial institutions and digital media platforms, ever since the digital India programme is launched the trend is seen going up & up with very minor hiccups at the initial stage(s) but again with the move of demonetisation the growth of digital payments sky rocketed.

Secondary Study:

7.1 Growing RUPAY

- NPCI launched RUPAY in 2012 as the domestic card payment network to compete with international players Visa and Master card.
- In 2013, RUPAY's market share was only 6%, however it rose to 30% by volume and value of transactions according to the data released by NPCI for 2018-19.
- RUPAY card usage at PoS devices has jumped 135% to 459 million transactions in FY 2017-18 as against 195 million in FY 2016-17.
- RUPAY claims to have 500 million cards issued by 1100 banks.



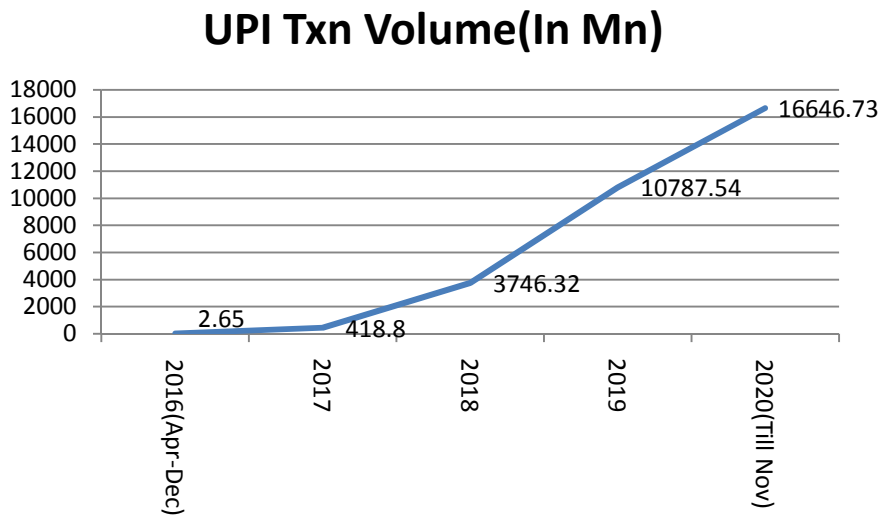
Graph showing Rise in RTGS and NEFT transactions (Data source: NPCI)

7.2 Sky rocketing UPI

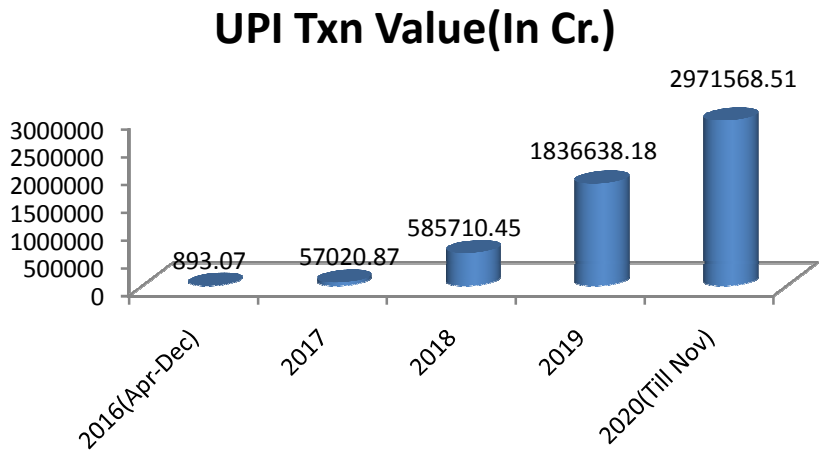
- With a slow start in 2016, it gradually took the very high speed that its YoY growth is simply an eye opener.
- There are 200 banks which are live on UPI and the number keeps on adding month on month.
- In Oct-2020, it recorded 2.07 billion transactions for the first time and in Nov-2020, the number have gone up to 2.21 billion.

Here are few charts which show the trajectory of UPI transaction since inception.
Data sources: NPCI

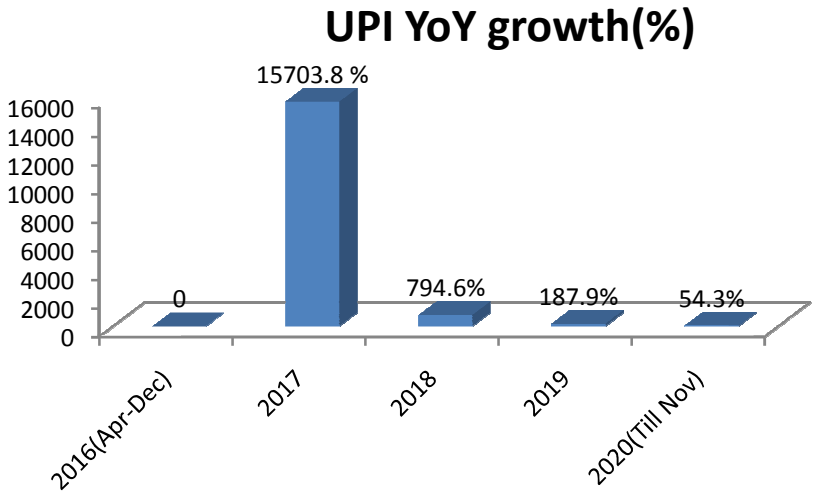
1.1.1 Graph showing transaction (volume in Mn).



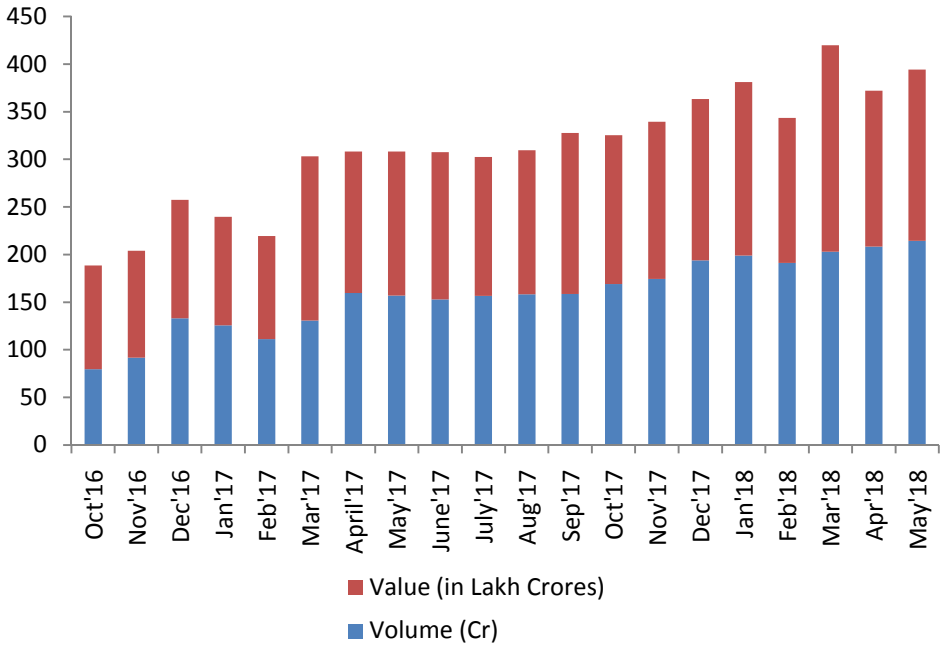
1.1.2 Graph showing transaction (value in Cr.)



1.1.3 Graph showing YoY Growth (%)



1.2 Month on Month comparison digital payment txns during Oct'16-May'18



7.3 Forecasting using Time Series Technique:

Forecasting is the art and science of predicting what will happen in the future. Sometimes that is determined by a mathematical method; sometimes it is based on the intuition of the operations manager. Most forecasts and end decisions are a combination of both.

Forecasting Approaches:

There are two predominant approaches to forecasting: qualitative approach and quantitative analysis.

a. Qualitative method

These techniques are subjective, based on the opinion and judgment of consumers and experts; they are appropriate when past data are not available. They are usually applied to intermediate- or long-range decisions.

- **Jury of executive opinion-** This is based on the inputs and decisions of high-level experts or management.
- **Delphi method-** Decision makers, staff, and respondents all meet to develop the forecast. Every shareholder in the process provides input.
- **Sales force composite-** Each sales person provides an individual estimate which is reviewed for realism by management, and then combined for a big picture view.
- **Consumer market survey-** This is surveying the prospective customer base to determine demand for existing products and can also be used for new products.

b. Quantitative method

These models are used to forecast future data as a function of past data. They are appropriate to use when past numerical data is available and when it is reasonable to assume that some of the patterns in the data are expected to continue into the future. Quantitative methods are in two categories. Time-series models predict by assuming the future is a function of the past. Associative models uses similar historical data inputs and then includes other external variables such as advertising budget, housing, competitor's prices and more.

Time Series Models	Associative Model
Naïve method	Linear regression
Moving averages	
Exponential smoothing	
Trend projection	

- Linear regression is a predictive modelling technique which finds out the relation between dependent variable (Y) and one or more than independent variables (x) using a **regression line** (also called best-fit straight line).
- It is a technique of forecasting or predicting the future data based on the current & past data.
- It is denoted by an equation **Y= mX+C**, where **m** represents slope of the line, **X** represents independent variable and **C** represents intercept.
- Here, we will see how linear regression can be used to predict the future data or do forecasting of UPI payments in terms of; (a) volume of UPI transactions, (b) value of UPI transactions using the past data.

Regression Statistics	
Multiple R	0.97793004660088
R Square	0.956347176044799
Adjusted R Square	0.953229117190856
Standard Error	234.18004792607
Observations	16

Multiple R. It is the C*orrelation Coefficient* that measures the strength of a linear relationship between two variables. The correlation coefficient can be any value between -1 and 1, and its absolute value indicates the relationship strength. The larger the absolute value, the stronger the relationship:

- 1 means a strong positive relationship
- -1 means a strong negative relationship
- 0 means no relationship at all

R Square. It is the *Coefficient of Determination*, which is used as an indicator of the goodness of fit. It shows how many points fall on the regression line. The R^2 value is calculated from the total sum of squares, more precisely; it is the sum of the squared deviations of the original data from the mean.

In our example, R^2 is 0.00, which is extremely bad. It means that 0% of our values fit the regression analysis model. Generally, R Squared of 95% or more is considered a good fit.

Adjusted R Square. It is the *R square* adjusted for the number of independent variable in the model. You will want to use this value instead of *R square* for multiple regression analysis.

Standard Error. It is another goodness-of-fit measure that shows the precision of your regression analysis - the smaller the number, the more certain you can be about your regression equation. While R^2 represents the percentage of the dependent variables variance that is explained by the model, Standard Error is an absolute measure that shows the average distance that the data points fall from the regression line.

Table: ANOVA

	df	SS	MS	F	Significance F
Regression	1.00	16820196	16820196	306.71	6.45E-11
Residual	14.00	767764	54840.29		
Total	15.00	17587960.14			

Basically, it splits the sum of squares into individual components that give information about the levels of variability within your regression model:

- *Df* is the number of the degrees of freedom associated with the sources of variance.
- *SS* is the sum of squares. The smaller the Residual SS compared with the Total SS, the better your model fits the data.
- *MS* is the mean square.
- *F* is the F statistic or F-test for the null hypothesis. It is used to test the overall significance of the model.
- *Significance F* is the P-value of F.

The ANOVA part is rarely used for a simple linear regression analysis in Excel, but you should definitely have a close look at the last component. The **Significance F** value gives an idea of how reliable (statistically significant) your results are. If Significance F is less than 0.05 (5%), your model is OK.

Table: Regression Coefficients

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-321125.6	18546.4	-17.31	7.52	-360903.67	-281347.5	-360903.7	-281347.5
Month of Sales	7.31	0.417	17.51	6.45	6.41	8.2	6.41	8.2

The most useful component in this section is **Coefficients**. It enables you to build a linear regression equation in Excel:

y=bx + a + e

Neglecting the error coefficient as the value is too big to consider, approximately 0.47.

For our data set, where *y* is the number of detectors sold and x is month of sales, our linear regression formula goes as follows:

```
Y = Month of Sales * x + Intercept
```

(Month of sales represents Month of Value and Volume of UPI transaction

Where,

Y= Predicted Number of Detectors which is Dependent variable

x= Month of Sales which is Independent variable

Assumptions taken in forecasting UPI Transaction (Value & Volume):

i) Variables like Age, Type of Profession (Private or Government Job and Students) do not have a significant impact on the trend of UPI transactions is kept constant as we saw from the Primary Study conclusion.

ii) Other variables like Consumer Income, Active Smartphone users having Internet availability and accessibility data is not available with respect to UPI transaction due to which they have also been kept constant in the linear regression study.

Below table contains Volume of UPI transactions and a forecasted value (highlighted in yellow) is calculated using linear regression technique.

Month	Volume of UPI trans.	Forecasting Value
Jan-21	2303	
Feb-21	2293	
Mar-21	2732	
Apr-21	2641	
May-21	2540	
Jun-21	2808	
Jul-21	3248	
Aug-21	3556	
Sep-21	3654	
Oct-21	4219	
Nov-21	4186	
Dec-21	4566	
Jan-22	4617	
Feb-22	4527	
Mar-22	5405	
Apr-22	5583	
May-22		5563
Jun-22		5790
Jul-22		6009
Aug-22		6236
Sep-22		6463
Oct-22		6682
Nov-22		6909
Dec-22		7128

The charts (graphs) are showing regression line and regression equation through which May to December'22 values are forecasted followed by a graph having forecasted values.

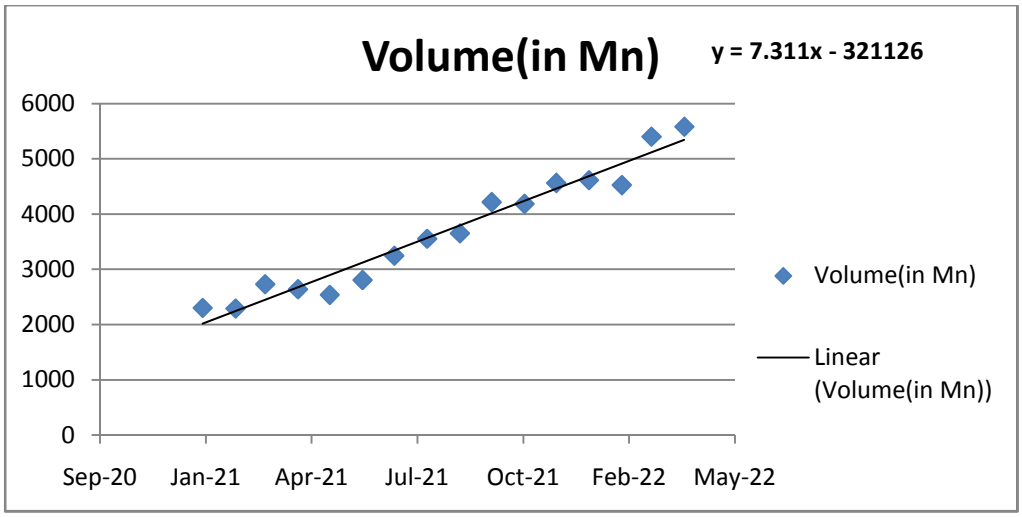


Fig.(b1) – Jan'21 to Apr'22- UPI Volume

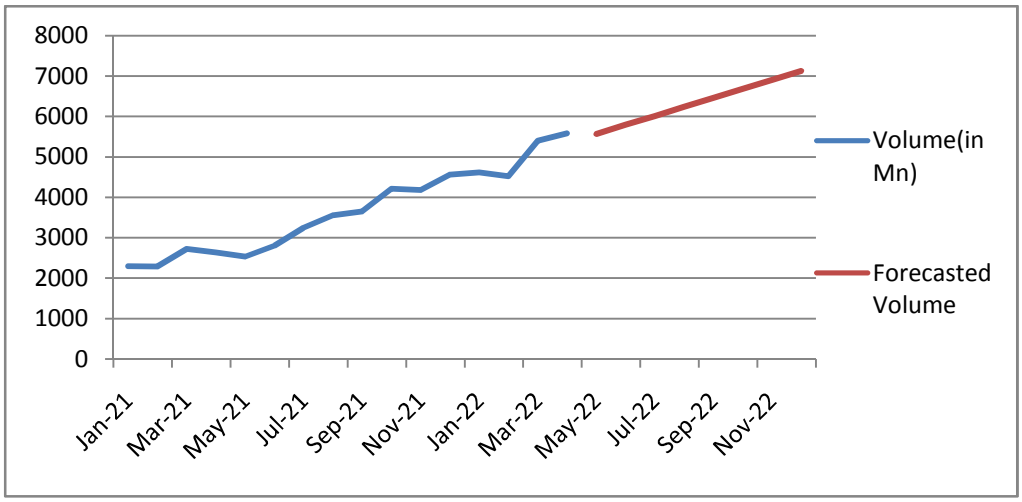


Fig.(b2) – Jan'21 to Apr'22 UPI Volume & May to Dec'22 Forecasted data

Below table contains Value of UPI transactions and a forecasted value (highlighted in yellow) is calculated using linear regression technique.

Month	Value of UPI trans.	Forecasting Value
Jan-21	431182	
Feb-21	425063	
Mar-21	504886	
Apr-21	493664	
May-21	490639	
Jun-21	547373	
Jul-21	606281	
Aug-21	639117	
Sep-21	654352	
Oct-21	771445	
Nov-21	768436	
Dec-21	826848	
Jan-22	831993	
Feb-22	826843	
Mar-22	960581	
Apr-22	983302	
May-22		993847
Jun-22		1032500
Jul-22		1069906
Aug-22		1108558
Sep-22		1147211
Oct-22		1184616
Nov-22		1223269
Dec-22		1260675

The charts (graphs) below are showing regression line and regression equation through which May to December'22 values are forecasted followed by a graph having forecasted values.

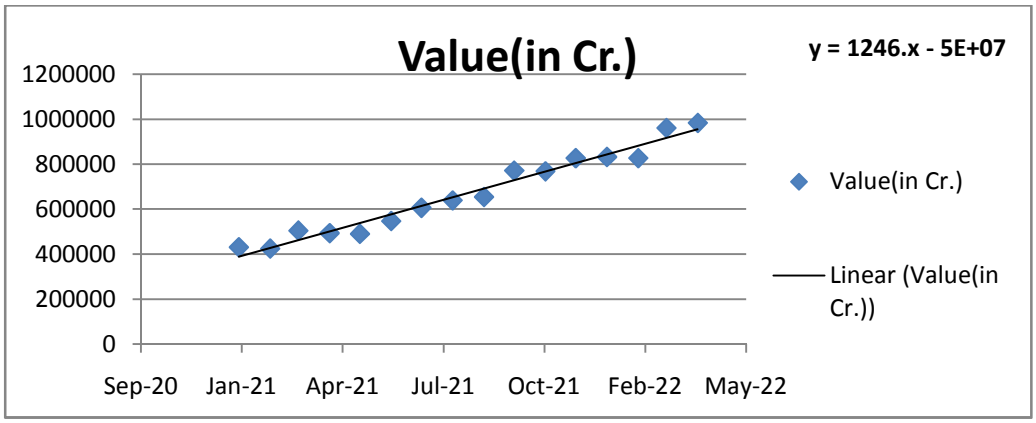


Fig.(c1) – Jan’21 to Apr’22- UPI Transaction value

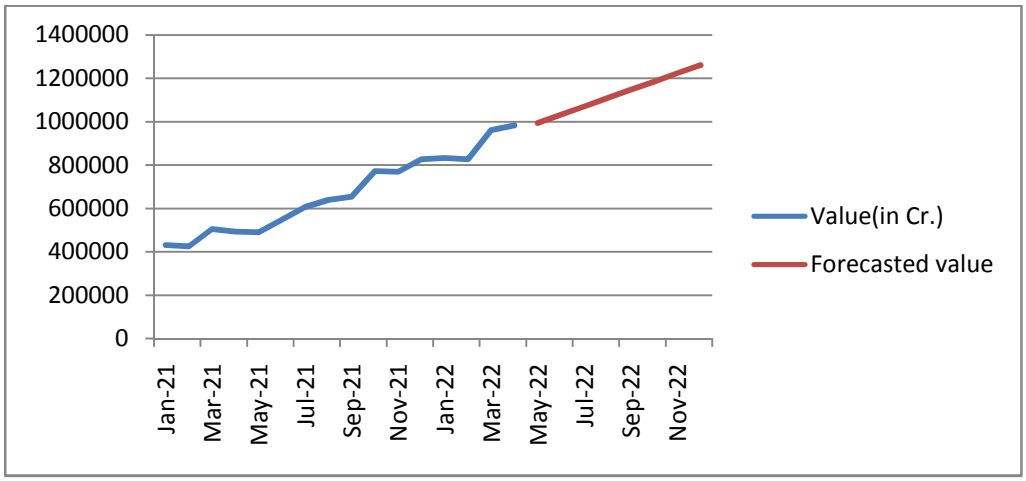


Fig.(c2) – Jan’21 to Apr’22- UPI Transaction value & May to Dec’22 Forecasted data

7.4 Primary Study:

A study is conducted on the sample size of 21 executive students' from different age groups. Respondents were given a Google form questionnaire survey to receive the responses to showcase the trends and consumer behaviour towards digital payments and transactions in Covid-19 pandemic.

Demographic and Basic Data points:

- Out of the 21 respondents, 16 Males & 5 Female participated.
- 10 respondents were under the age bracket of 18-30 years, 9 respondents under 31-45 years, and 2 respondents fall under 46-60 years of age bracket.
- 16 respondents were into Private jobs, 4 were having Government job and 1 student.
- All 21 respondents said "Yes" when they were asked that they know about Digital Payment and use digital payments to make their payments irrespective the sector they're working.
- All 21 responses for Cashless Payments among Cash & Cashless payments.

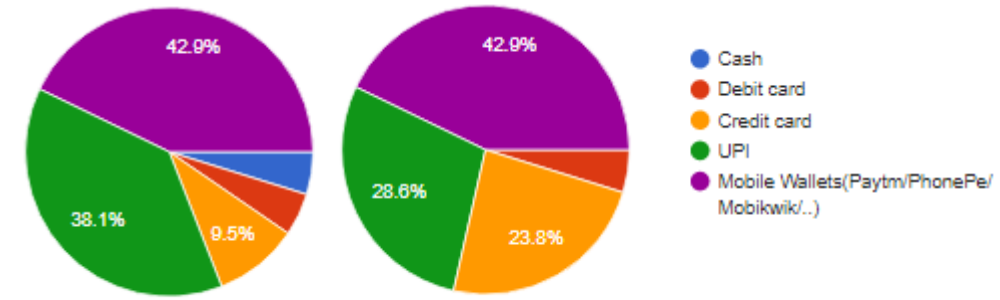
Analysis based on Questionnaire:

- On being asked "How frequently they prefer to make digital payments", 10 responses for Very Frequently, 9 for Almost Daily and 2 for Depends on the product/item/service purchased/availed.

Fig.4.5.2 Percentage shown for frequent usage of digital payments on a Pie chart

- **Payments Trend in Retail Stores/Shops/Merchants/.. Vs Online Market Place/Food Ordering/Cab Booking/..**

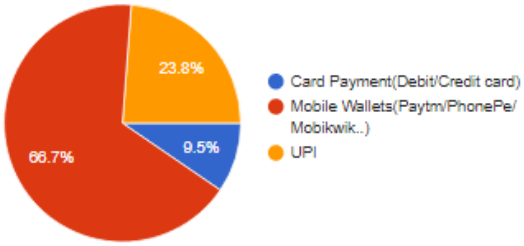
Payment Modes	Payments at Retail Stores or shops or Merchants	Payments at Online Market Places, Food Ordering Websites, Booking cabs, etc
Cash	*1*	*0*
Debit Card	*1*	*1*
Credit Card	*2*	*5*
UPI	*8*	*6*
Mobile Wallets(Paytm/PhonePe/Mobikwik/..)	*9*	*9*



Retail Stores/Shops/Merchants Vs Online Market place/Food/Cab

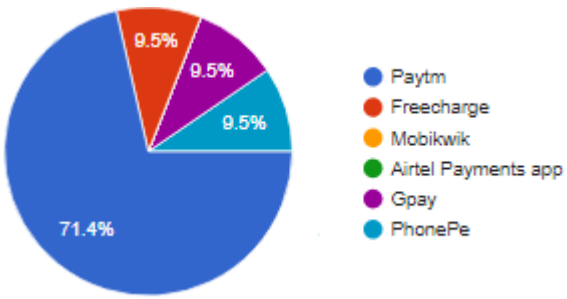
- **Preferable mode of Payment for Recharges & Utility Bills**

  - 14 responses for Mobile Wallets (Paytm/PhonePe/Mobikwik/..)
  - 5 responses received for UPI
  - 2 responses for Card payments

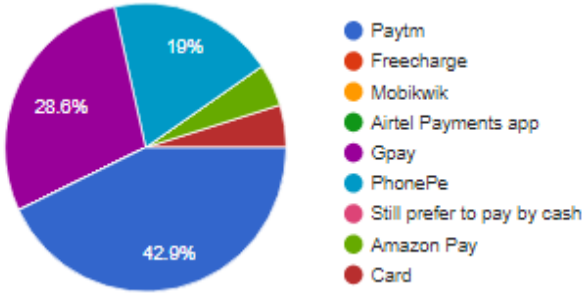


- **First Payments App being used by Respondents**

  - 15 responses for Paytm
  - 2 for PhonePe
  - 2 responses for Gpay
  - 2 for Freecharge

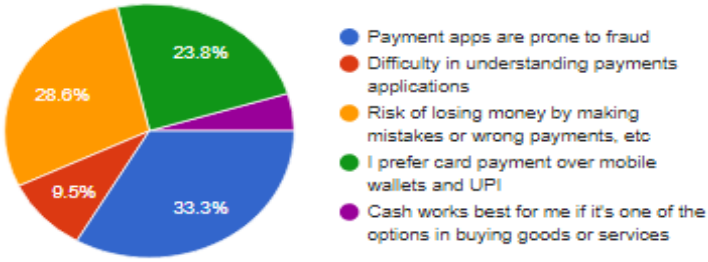


- **Payments App being used in Covid-19 lockdown for buying essentials**



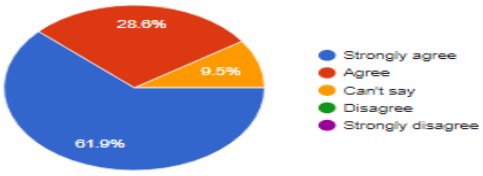
- Paytm is being used maximum by 9 respondents
- Gpay is used by 6 respondents
- PhonePe by 4 respondents
- Amazon Pay and Card payment getting 1 response each

- Respondents were asked why they still can't rely much on Payments app in this digital or smart phone era, here are their supporting statements.
  - Top reason is Apps are prone to Fraud.
  - People feel risk of losing money by committing mistakes.
  - Card is the preference over these apps followed by less understanding of apps.



- **People were asked if the apps become safe, secure and fraud proof, would they make a complete switch.**

- 13 Respondents strongly agree with the theory,
- 6 agrees with the theory of making a complete switch,
- 2 respondents "can't say" about making a complete switch to payments apps even these become safe, secure and fraud proof.



Conclusion of Primary Study

With the advancements in technology and increase of smart phone usage, and digital payments applications plus the government promoting Digital India Initiative people have adapted digital payments methods more and more.

Based on the primary study conducted on 21 respondents, irrespective of the demography (age, type of profession), people are interested in completing their transactions and payments via different Digital Payment methods even if the transaction made is in Retail stores or on online market place or for cab service.

Covid-19 has also become one of the major factors in shifting to cashless payments or we can say cashless or digital payments are considered to be one of the protective measures in making/completing payments and transactions.

With this study we can draw that people are not reluctant to use digital payments and associated apps in buying daily essentials or making large monthly payments or simply paying utility bills. However, the factors which generate some reluctance in consumer's mind are these payment apps are prone to fraud also people are afraid of losing money upon making mistakes. But the interesting thing to conclude is end users are willing to make complete switch if there is a guarantee of safe, secure and no fraud.

8. SUGGESTIONS

- Government can ensure to the end user or the citizen of the country that the operation of digital payment is free from any transaction(s) cost which in turn helps the customers to do various transactions (banking, shopping, booking tickets, bill payments, etc) online.
- Government should provide (time to time) concession to the retailers, merchants and other businesses who sell their products and services via digital mode and this in turn will encourage all the merchants to accept digital payments.
- Training Programmes can be organised by the government to train the end user (especially in Tier 4, 5, 6 cities, towns and villages) to make use of the digital payments.
- Government can give extensive media coverage (like "Janhit me Jari" or Issued in Public Interest) through TV news/ shows, Radio or social networking or newspapers/magazines about the benefits of digital payments.
- Customers must also be able to comply with terms and conditions of Digital payment methods, notify the remitterbank about the payment and keep track on the balance, especially after each transactions.

9. Limitations of the Study

This report is based on the Primary and Secondary data. The primary data is collected from the sample size of executive management students of varied age groups based in Delhi NCR only. Delhi NCR being the commercial hub of North India and being most significant in conducting a research, the sample size of 21 was a bit low in number considering the survey being conducted in a college. It might lack the diversity of the population of the country. However, the objective of the survey was to validate the perception of end users (customers) related to digital payments and adaption of digital payments in Covid-19 pandemic. The variables or factors such as Consumer Income and Active Smartphone users (having internet availability and accessibility) are taken as constants in doing Linear Regression Technique as their secondary data is not available with respect to UPI transaction(value and volume). Therefore, it may not obstruct in creating the desired objective(s) even if the target group or sample size did not cover the diverse and maximum part of the population.

10. CONCLUSION

Based on the data of last 5 years, India has seen tremendous growth in digital payment system. With more than 450 million mobile-phone internet users in 2020 and is expected to reach around 500 million in the year 2023 according to a report by Statista.com, this digital payment system will definitely grow by leaps and bounds with the times to come. With the change in Govt policies (new initiatives and programmes) to change the end user's notion and providing awareness to every section of the society like we saw in the form of Digital India programme in 2015 and Demonetisation in 2016.

To provide and improve the internet connectivity in small towns and villages, Govt of India is coming up under PM-WANI (Prime Minister WiFi Access Network Interface) which will increase the internet penetration and will in turn add more and more consumers to digital platform.

The NPCIs UPI being the prominent payment mode in the market with skyrocketing transactions going month on month followed by RUPAY, Mobile wallets and Internet Banking (NEFT, RTGS, IMPS) are becoming the strong pillars of the Indian payments ecosystem and proving to be the flag barriers in cashless economy.

11. REFERENCES

i) https://www.outlookindia.com/outlookmoney/technology/tracing-indias-journey-in-the-digital-payments-domain-3378

ii) https://www.meity.gov.in/digidhan#:~:text=The%20Digital%20India%20programme%20is,empowered%20society%20and%20knowledge%20economy.&text=The%20Vision%20is%20to%20provide,affordable%2C%20quick%20and%20secured%20manner.

iii) https://www.statista.com/topics/5593/digital-payment-in-india/

iv) data.gov.in

v) https://theknowledgereview.com/the-rise-of-digital-payments-in-india/

vi) http://cashlessindia.gov.in/digital_payment_methods.html

vii) https://www.dsci.in/content/fraud-and-risk-management-in-digital-payments#:~:text=Types%20of%20Frauds&text=Cyber%20security%20frauds%20%2D%20account%20takeover,theft%2C%20triangulation%20fraud%2C%20etc.

viii) https://www.researchgate.net/publication/336835369_An_Overview_On_Digital_Payments

ix) https://www.statista.com/statistics/558610/number-of-mobile-internet-user-in-india/

x) https://www.livemint.com/companies/news/google-pay-continues-upi-leadership-in-nov-whatsapp-pay-makes-a-slow-start-11607361449732.html

xi) https://www.npci.org.in/what-we-do/upi/product-statistics

xii) https://www.npci.org.in/statistics

xiii) https://blog.hubspot.com/sales/regression-analysis-to-forecast-sales

xiv) Panda, S. (2020, December 2). UPI records over 2 bn transactions for second time in a row in November Business-Standard.com. https://www.business-standard.com/article/economy-policy/upi-records-over-2-bn-transactions-for-second-time-in-a-row-in-november-120120100581_1.html

xv) https://www.pymnts.com/tag/digital-payments/

xvi) https://acadpubl.eu/hub/2018-119-15/3/546.pdf

xvii) https://ijirt.org/master/publishedpaper/IJIRT150447_PAPER.pdf

xviii) https://economictimes.indiatimes.com/news/economy/policy/demonetisation-to-kill-black-money-rbi-directors-didnt-agree/articleshow/68354774.cms?from=mdr

ANNEXURE 1

Annexure of Questionnaire

Q1. Do you know about digital payment? - Yes, NO

Q2. Do you use digital payment methods to make your payments? - Yes, No

Q3.How frequently you prefer to make digital payments?

-Almost Daily

-More often

-Depends on the product/item/service purchased/availed

-Only for completing monthly liabilities or slightly amount (Rent, Loan, Tution fees, etc)

Q4.What mode of payment do you prefer usually if you are given a choice.

I prefer_____

-Cash

-Cashless (digital/online)

Q5. I prefer to make payments via_____ at retail store or shop or merchant or small vendors at the time of purchase

-Cash

-Debit Card

-Credit Card

-UPI

-Mobile Wallets (Paytm/PhonePe/Mobikwik..)

Q6. I prefer to make payments via_____ at online market places, food ordering websites, cab services, etc.

-Cash

-Debit Card

-Credit Card

-UPI

Q7. Which is your most preferable online payment method for recharges, making utility bill payments?

I mostly prefer_____

-Card Payment (Debit/Credit card)

-UPI

-Mobile Wallets (Paytm/PhonePe/Mobikwik..)

Q8. Which is the first payments app you started using?

-Paytm

-Freecharge

-Mobikwik

-Airtel Payments app

Q9. Among the following apps, which app you use most for buying daily essentials and making payments currently..

-GPay

-PhonePe

-Paytm

-Others (mention)

-Still prefer to pay by cash

Q10. In this digital or smart phone era, I still don't rely much on digital payment app(s).

Which is the best supporting statement according to you from the following ones..

-Digital payment is unsafe and insecure

-It is prone to fraud

-Difficulty in understanding payments applications

-Risk of making mistakes or wrong payments, etc

-I prefer Card payments over mobile wallets and UPI

-Cash works best for me unless it's not an option in buying goods or services

Q11. I can think of making a switch to payment app(s) completely for all my payments (online/offline) if these apps become all safe, secure and fraud proof..

I_____

-Strongly agree

-Agree

-Can't say

-Disagree

-Strongly disagree

ANNEXURE 2

Plagiarism Report (Snapshot)

turnitin

Similarity Report ID: oid:27535:16589518

PAPER NAME

2K20-EMBA22-Major Project (1).pdf

WORD COUNT	CHARACTER COUNT
6439 Words	36792 Characters
PAGE COUNT	**FILE SIZE**
39 Pages	1.3MB
SUBMISSION DATE	**REPORT DATE**
May 6, 2022 11:48 PM GMT+5:30	May 6, 2022 11:49 PM GMT+5:30

15% Overall Similarity

The combined total of all matches, including overlapping sources, for each database.

- 14% Internet database
- Crossref database
- 13% Submitted Works database
- 4% Publications database
- Crossref Posted Content database

Excluded from Similarity Report

- Bibliographic material
- Cited material
- Quoted material
- Small Matches (Less then 8 words)